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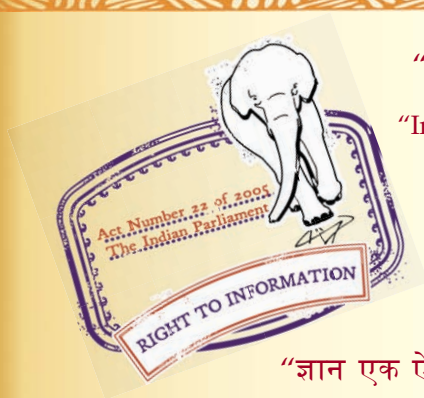
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IS 4743 (1968): Settling Tanks for Ghee (Stainless Steel)
[FAD 19: Dairy Products and Equipment]



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Indian Standard

**SPECIFICATION FOR
SETTLING TANKS FOR GHEE
(STAINLESS STEEL)**

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Indian Standard

SPECIFICATION FOR SETTLING TANKS FOR GHEE (STAINLESS STEEL)

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Indian Standard

SPECIFICATION FOR SETTLING TANKS FOR GHEE (STAINLESS STEEL)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 26 July 1968, after the draft finalized by the Dairy Equipment Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Settling tanks for ghee are used in the ghee refineries and dairies to remove non-fatty solids from ghee by allowing the heated ghee to stand. This standard would help the fabricator and the user to obtain quality equipment meeting the desired mechanical and hygienic requirements.

0.3 Settling tanks for ghee may be of the following four types:

- a) Single-walled;
- b) Double-walled (single-jacketed) with a provision for circulation of water or steam or both;
- c) Double-jacketed, insulated with a provision for circulation of water or steam or both in the inner jacket; and
- d) Double-walled, insulated.

0.3.1 This standard covers the requirements for single-walled settling tanks for ghee only, as they are most commonly used.

0.4 The nominal capacities as recommended in IS:2843-1964* have been adopted in sizing the settling tanks.

0.5 This specification includes the requirements for both cylindrical and rectangular tanks. Cylindrical tanks with conical bottoms are comparatively less costly as compared with rectangular tanks as the cost of the material and fabrication would be less. The requirements for rectangular tanks have been included in the standard as tanks of this shape are used in some of the ghee refineries.

*Recommendations on nominal capacities for process equipment.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the important constructional details and dimensional requirements for single-walled stainless steel settling tanks (vertical cylindrical and rectangular) for ghee.

2. CAPACITY

2.1 The tanks shall be constructed in capacities of 500, 800, 1 250, 2 000 and 3 200 litres.

2.1.1 The capacity is a rounded off value of the calculated capacity of the container which includes the volume of the bottom but does not include the volume of branches.

3. MATERIAL

3.1 All the component metallic parts of tanks which come into contact with the ghee, and the cover shall be constructed from stainless steel conforming to Grade 07Cr19Ni9 of Schedule V of IS:1570-1961†. The weld areas and the deposited material shall be as corrosion resistant as the parent material.

3.2 The cover and the manway shall also be constructed from stainless steel conforming to Grade 07Cr19Ni9 of IS:1570-1961†.

3.3 Non-metallic material may be used for sealing, but such material shall be non-toxic, relatively non-absorbent and shall not impart any flavour and dissolve in the ghee or cleaning solutions or bactericidal agents normally used.

3.4 All such parts of the surfaces which do not come into contact with the ghee shall be made of a material which is either corrosion resistant or is rendered corrosion resistant by a suitable preventive treatment on a prepared surface.

4. SHAPE AND DIMENSIONS

4.1 The cylindrical settling tanks of 500, 800, 1 250 and 2 000 litres capacities shall be with conical bottom (10°) and partly open top with removable

*Rules for rounding off numerical values (*revised*).

†Schedules for wrought steels for general engineering purposes.

cover. The vertical cylindrical settling tank of 3 200 litres capacity shall have conical bottom (10°) and closed conical top with manway. The leading dimensions of vertical cylindrical tanks shall be as given in Table 1 and for rectangular tanks, as given in Table 2 (*see also* Fig. 1, 2 and 3).

TABLE 1 DIMENSIONS OF VERTICAL CYLINDRICAL SETTLING TANKS FOR GHEE

(Clause 4.1, and Fig. 1 and 2)

CAPACITY	OUTER DIAMETER	HEIGHT ON STRAIGHT CYLINDRICAL BODY
(1)	(2)	(3)
litres	mm	mm
500	900	860
800	1 100	1 150
1 250	1 200	1 120
2 000	1 400	1 315
3 200	1 600	1 600

TABLE 2 DIMENSIONS OF RECTANGULAR SETTLING TANKS FOR GHEE

(Clause 4.1, and Fig. 3)

CAPACITY	INSIDE LENGTH (A)	INSIDE WIDTH (B)	OVERALL HEIGHT (C)	CLEAR HEIGHT ON SHALLOW ENDS (D)	CLEAR HEIGHT AT DRAIN CENTRE TO FLOOR LEVEL	NO. OF LEGS	COVER SECTIONS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
litres	mm	mm	mm	mm	mm		
500	1 500	1 000	825	450	400	4	2
800	1 800	1 000	950	450	400	4	2
1 250	2 000	1 200	1 025	450	400	6	3
2 000	2 400	1 400	1 105	450	400	8	4
3 200	3 000	1 600	1 225	475	400	8	4

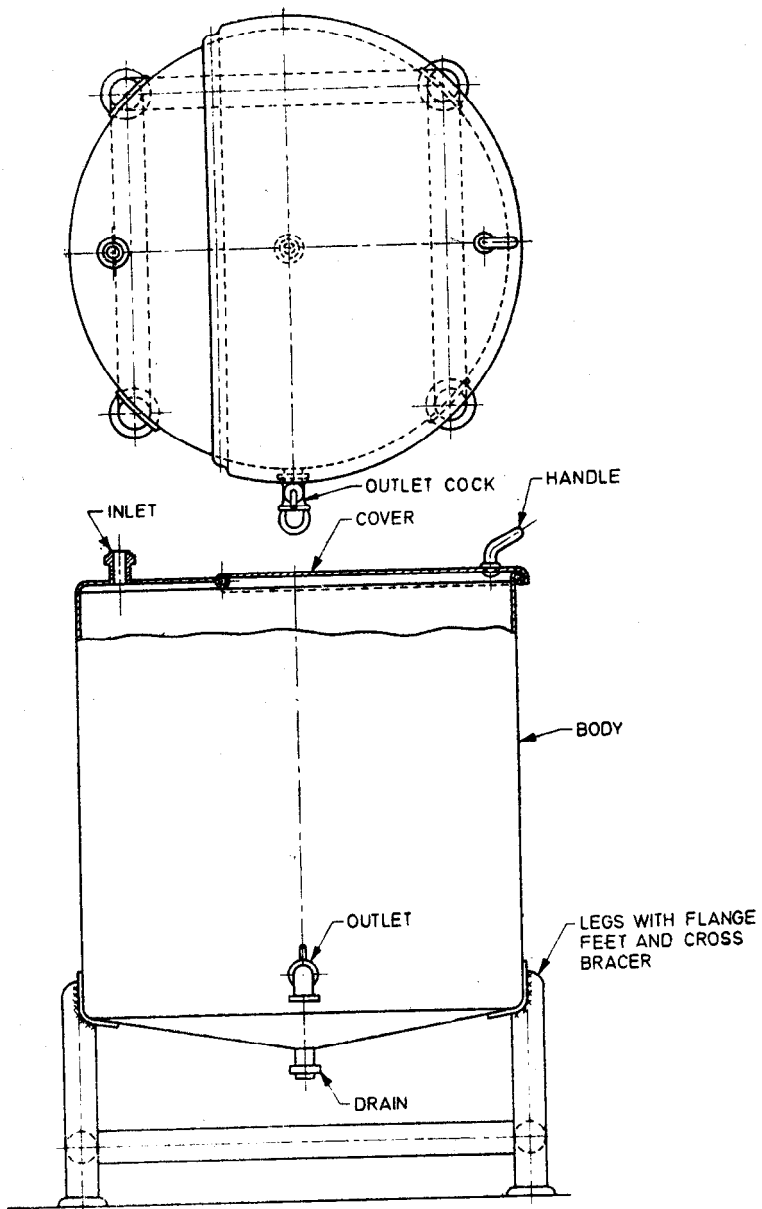


FIG. 1 TYPICAL CYLINDRICAL SETTLING TANK FOR GHEE OF
500 TO 2000 LITRES CAPACITY

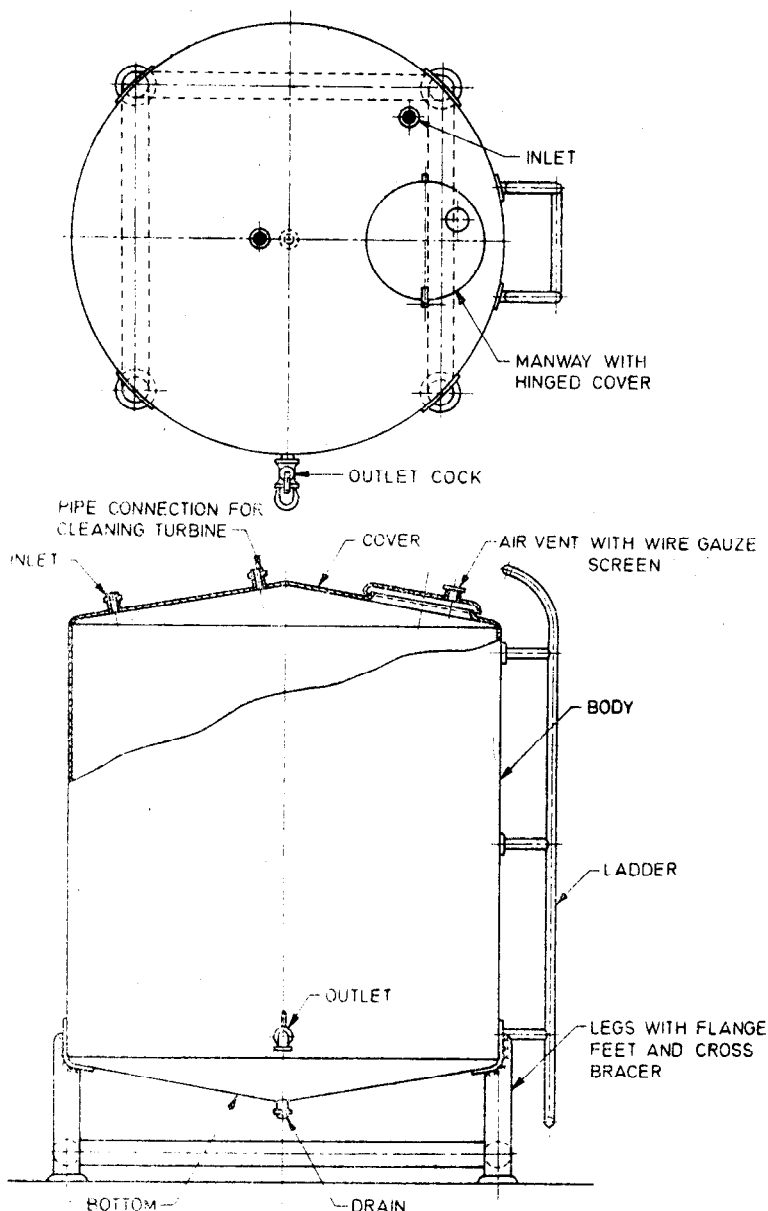
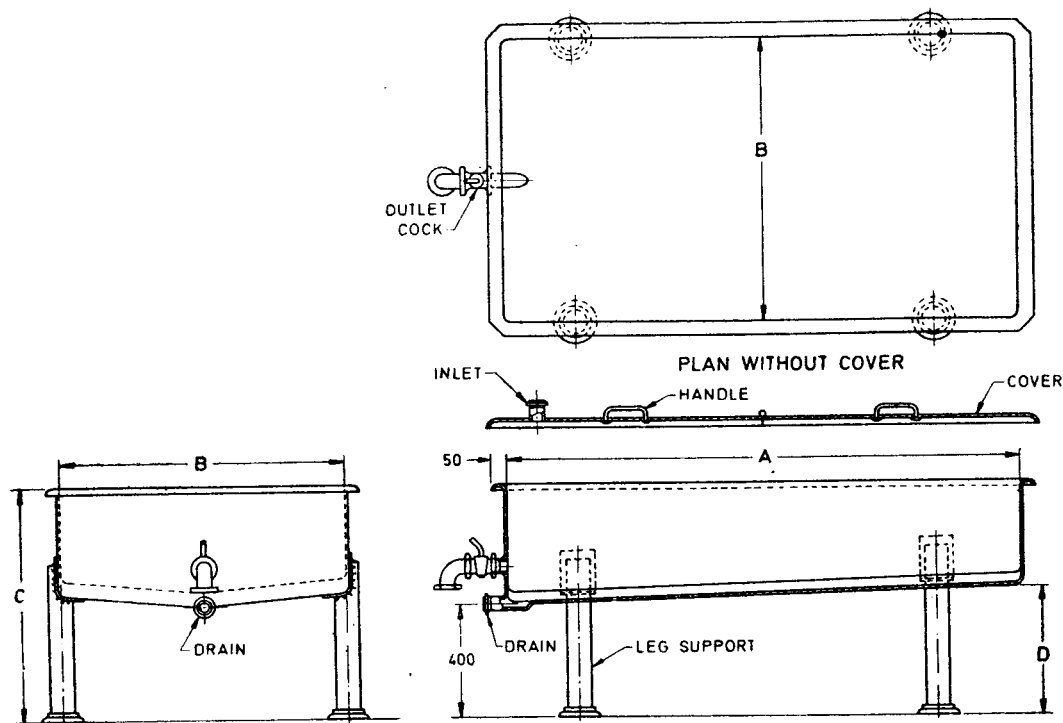


FIG. 2 TYPICAL CYLINDRICAL SETTLING TANK FOR GHEE OF 3200 LITRES CAPACITY



All dimensions in millimetres.

FIG. 3 TYPICAL RECTANGULAR SETTLING TANK FOR GHEE

5. THICKNESS OF MATERIAL

5.1 The minimum thickness of the material for tanks and cover shall be as given in Tables 3 and 4.

TABLE 3 THICKNESS OF MATERIAL FOR CYLINDRICAL TANKS

CAPACITY	BODY	BOTTOM	COVER
(1)	(2)	(3)	(4)
litres	mm	mm	mm
500	1.5	2.0	1.5
800	2.0	2.5	1.5
1 250	2.0	2.5	2.0
2 000	2.0	2.5	2.0
3 200	3.5	4.0	2.0

TABLE 4 THICKNESS OF MATERIAL FOR RECTANGULAR TANKS

CAPACITY	TANK	COVER
(1)	(2)	(3)
mm	mm	mm
500	1.5	1.5
800	2.0	1.5
1 250	3.0	2.0
2 000	3.0	2.0
3 200	4.0	2.0

6. FABRICATION

6.1 The typical designs of the settling tanks for ghee of different capacities are shown in Fig. 1, 2 and 3.

6.2 All joints which come into contact with ghee shall be butt welded and finished smooth by buffing with IS Grit No. 220 (see IS : 3178-1965*).

6.3 All surfaces which come into contact with ghee shall be free from crevices and finished smooth. All inside corners shall have a radius of not less than 25 mm.

*Specification for abrasive emery grain.

IS: 4743 - 1968

6.4 All component parts and appurtenances having surfaces in contact with ghee shall be easily removable for cleaning or shall be readily cleanable in their places.

6.5 The tank shall be so constructed that it will not sag, buckle or prevent complete drainage.

6.6 The brim of the tanks of 500 to 2000 litres capacities shall be strengthened by double folding the top edges outwards. The brim of the 3200-litre cylindrical tank shall be as shown in Fig. 2. The brim of all rectangular tanks shall be folded outside.

7. SUPPORTS

7.1 The tank shall be supported on four or more legs welded over doubling pads provided on the body of the tank. The pads shall be of stainless steel of Grade 07Cr19Ni9 of IS: 1570-1961*. The legs shall be of sufficient size and appropriate spacing to carry the tank when full.

7.2 The length of the legs shall be such that there shall be a maximum straight clearance of 400 mm between the bottom-most part of the cylindrical tank and the floor level, and 400 mm between the floor level and the centre of the drain of rectangular tanks.

7.3 The legs shall have flanged feet.

8. COVER

8.1 For the tanks with partly open top, loose removable cover with lifting handle shall be provided. All rectangular tanks shall have covers in suitable sections with overlapping edges for sections.

9. INLET

9.1 A vertical inlet pipe connection terminating with a 50·8-mm male part (see IS: 3382-1965†) shall be provided on the top of the tanks.

9.2 The inlet shall project to 75 mm from the tank surface or cover surface.

10. MANWAY

10.1 Tanks of 3200 litres capacity shall have on the top end circular manway having a minimum internal diameter of 450 mm and provided with hinged cover.

10.2 An air vent with wire gauze screen of sufficient cross-sectional open area, to prevent formation of vacuum in the tank, shall be provided on the cover of the manway.

*Schedules for wrought steels for general engineering purposes.

†Specification for stainless steel milk pipes and fittings.

10.3 The manway and cover shall be fabricated from stainless steel conforming to Grade 07Cr19Ni9 of IS : 1570-1961*.

11. OUTLET

11.1 In case of cylindrical tanks, a side outlet connection shall be so located on the straight cylindrical body that the distance between the centre line of the outlet and the line joining bottom to body is 100 mm.

11.2 In case of rectangular tanks, a side outlet connection shall be so located on the end that the distance between the centre lines of the outlet and the drain is 130 mm.

11.3 The outlet shall be of a minimum size of 50·8 mm terminating with a 50·8-mm male part (*see* IS : 3382-1965†).

11.4 The outlet shall project to 75 mm from the tank body in case of cylindrical tanks and to 100 mm in case of rectangular tanks.

11.5 The outlet connection shall be provided with a stop cock and a welded type 50·8-mm bend (*see* IS : 3382-1965†).

12. DRAIN

12.1 A vertical drain connection for cylindrical tanks and horizontal drain connection for rectangular tanks shall be located on the lowest part of the bottom.

12.2 The drain shall be of a minimum size of 50·8 mm terminating with a 50·8-mm male part (*see* IS : 3382-1965†).

12.3 In case of cylindrical tanks, the drain shall project to 75 mm from the bottom-most position of the conical bottom and in case of rectangular tanks it shall project to 75 mm from the tank body.

13. ACCESS LADDER

13.1 For the cylindrical tank of 3 200 litres capacity, an external stainless steel ladder supported from the body of the tank shall be provided to get access to the top of the tank.

13.2 For the tanks of 800 to 2 000 litres capacity, a suitable stainless steel foot board may be provided for easy inspection of the inside of the tank.

14. CLEANING TURBINE

14.1 For the vertical tank of 3 200 litres capacity a pipe connection of a minimum size of 50·8 mm terminating with a male part (*see* IS : 3382-1965†) with a spraying device shall be fitted on the top of the tank to facilitate cleaning.

*Schedules for wrought steels for general engineering purposes.

†Specification for stainless steel milk pipes and fittings.

15. LEAKAGE TEST

15.1 The tank fitted with stoppers for outlet and drain shall not leak when filled with water up to the brim.

16. MARKING

16.1 Each settling tank shall be indelibly and legibly marked with the following information:

- a) Manufacturer's name, trade-mark or initials;
- b) Year of manufacture; and
- c) Capacity of the tank.

16.1.1 Each tank may also be marked with the ISI Certification Mark.

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 331 01 31
331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

Telephone

Central	: Manak Bhavan, 9, Bahadur Shah Zafar Marg, NEW DELHI 110002	{ 331 01 31 331 13 75
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